Operating Experience Weekly Summary 98-02

January 9 through January 15, 1998

Table of Contents

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EVENTS

1. LOCKOUT/TAGOUT VIOLATION AT HANFORD

On January 6, 1998, at the Hanford Site, waste management employees discovered that subcontractors removed a valve from steam piping and reinstalled it in violation of Hanford's lockout and tagout program. The valve was an isolation point for a lockout/tagout and had the required tag and physical locking mechanism installed. No steam was being supplied to the line where the workers removed the valve because the steam source was in an outage. Work on this valve was being performed as part of an on-going job to tie in a new boiler. There were no injuries or equipment damage. It is important that personnel adhere to established lockout/tagout programs and procedures because they protect personnel from injury and equipment from damage and provide overall control of equipment and system status. (ORPS Report RL--PHMC-200LWP-1998-0001)

Subcontractor personnel worked on this valve as part of an on-going job to tie in a new package boiler to provide steam for a liquid waste evaporator. The valve was located outside the building where workers were installing the new boiler. Facility managers held a critique during which the subcontractor workers stated that they did not see the lockout or the tag. Critique attendees also determined that work that violated the lockout/tagout occurred when the building was locked and unoccupied and the lockout/tagout holder was unavailable to clear the lockout/tagout.

This event underscores the need for personnel to ensure that the lockout/tagout process is properly administered. Lockout/tagout holders should verify that the locks and tags have been correctly installed on the isolation boundaries and the paperwork is signed indicating acceptance and responsibility for the lockout. Also, personnel who work on high-energy systems need to be aware of the presence of lockouts and of the requirement to clear the lockout/tagout with the holder before working on these systems. The following references address lockout/tagout requirements and provide guidance for independent verification.

- DOE-STD-1030-96, *Guide to Good Practices for Lockouts and Tagouts*, provides guidance on lockout/tagout program implementation and management at DOE facilities. The standard defines a lockout/tagout holder as a qualified individual who is authorized to work, or to supervise work, under a centrally controlled lockout/tagout. A lockout/tagout holder is the same as the authorized person who is responsible for (i.e., being protected by) the lockout or tagout device or the employee in charge of the clearance as designated by OSHA. Section 4.4.2, "Documentation of Lockout/Tagout," states that if a lockout/tagout involves multiple isolation points or uses several individuals or work groups, it should document (1) authorization, (2) placement of locks and tags, (3) verification of effectiveness, (4) acceptance by individual workers or work group representatives, (5) release by workers at the completion of the job, (6) authorization for removal of locks and tags, and (7) restoration to operable condition.

- DOE O 5480.19, *Conduct of Operations Requirements for DOE Facilities*, chapters IX, "Lockouts and Tagouts," states that a tagout program includes the placement of a tagout device on an energy-isolating device, in accordance with an established procedure, to indicate that the energy-isolating device and the equipment being controlled may not be operated until the tagout device is removed.

- DOE-STD-1036-93, *Guide to Good Practices for Independent Verification,* states that independent verification should always be performed after installation of a lockout/tagout to ensure adequate protection for workers. Section 4.3.7, "Verifying Locked/Tagged Components," states that the verifier should verify that the correct component has been identified and the position of the component is as stated on the danger tag.

- OSHA regulations contain several references to lockout/tagout. These include: 29 CFR 1910.147, *The Control of Hazardous Energy (Lockout/Tagout)*; 29 CFR 1910.333, *Safety-Related Work Practices*; 29 CFR 1910.269, *Electric Power Generation, Transmission, and Distribution*; and 29 CFR 1926.417, *Lockout and Tagging of Circuits*.

- Two Safety Notices and one Safety Note on this subject have been issued: DOE/EH-0540, Safety Notice 96-05, *Lockout/Tagout Programs*; DOE/EH-0502, Safety Notice 95-02, *Independent Verification and Self-Checking*; and DOE/EH-0180, Safety Note, 91-04, *Control of Hazardous Energy*.

- DOE-EH-33, *Hazard and Barrier Analysis Guide,* provides techniques and tools for determining the effectiveness of barriers, such as the lockout/tagout, for the safe execution of work.

Safety Notices 96-05 and 95-02 can be obtained by contacting the ES&H Information Center, (800) 473-4375, or by writing to U.S. Department of Energy, ES&H Information Center, EH-72, 19901 Germantown Road, Germantown, MD 20874. Safety Notices are also available on the OEAF Home Page at http://tis.eh.doe.gov:80/web/oeaf/lessons_learned/ons/ons.html. A copy the *Hazard and Barrier Analysis Guide* is available from Jim Snell, (301) 903-4094, and may also be obtained by contacting the ES&H Information Center, (800) 473-4375, or by writing to U.S. Department of Energy, ES&H Information Center, EH-72, 19901 Germantown Road, Germantown, MD 20874.

KEYWORDS: communication, inattention to detail, lockout and tagout

FUNCTIONAL AREAS: Mechanical Maintenance, Work Planning

2. ICE PLUG IN DIESEL COOLING WATER DISCHARGE PIPING RESULTS IN FIRE

On January 6, 1998, at the Idaho National Engineering and Environmental Laboratory, an ice plug in the cooling discharge piping of a diesel-driven standby raw water pump caused the engine to overheat, igniting the wrapping on insulation for the turbocharger and exhaust piping. The diesel standby pump started, as designed, in response to low system water pressure because the electric primary pump tripped off line. Operators, responding to complaints of low water pressure and a report of water being discharged from the pump house, went to check the diesel standby pump and found the building filled with smoke and the diesel engine making unusual noises. Investigators reported that one of the operators entered the smoke-filled building and shut down the diesel engine while others called the fire department. Fire department personnel extinguished the flames and determined that the fire was limited to wrapping material on exhaust system insulation. Damage was limited to the diesel engine, and there were no injuries as a result of this occurrence. (ORPS Report ID--LITC-LANDLORD-1998-0001)

The standby raw water pump is located in a normally unoccupied pump house along with three booster pumps for the potable water system. The water being discharged from the pump house was normal for standby raw water pump operations because the standby pump was oversized and operators had adjusted the pump relief valve to lift at a pressure closer to normal raw water system pressure. The diesel is cooled by a "once-through" cooling system rather than a closed, fan and radiator type cooling system.

Investigators determined that an ice plug formed in the diesel cooling water discharge line because of a leaking regulator valve. They also found that, until 1994, the cooling water discharge line had been protected by heat tape and was checked periodically as part of the freeze protection program. However, workers removed the heat tape after an engineer erroneously determined that it was not needed. Investigators determined that, immediately after the operators received the complaints of low system pressure, they observed that the pressure was unusually high. A possible reason for the pressure fluctuations lies in the use of an oversized pump and the use of a pressure relief valve instead of a pressure regulating valve. The inability of a pumping system to maintain a steady pressure may contribute to early failure of downstream piping and equipment. Hanford Site occurrence reporters recently submitted a final report where pressure surges in a water distribution system arising from the use of grossly oversized pumping equipment may have contributed to the failure of the water main piping. (ORPS Report RL--PHMC-S&W-1997-0007)

While her actions were heroic, the operator who shut down the diesel engine put herself at great risk by entering a smoke-filled building. This may have saved equipment from further damage, but such a risk of grave injury is never advocated. According to the NFPA, in a building fire, the most common hazard to humans is from smoke and toxic gases. Most building-related fire deaths are directly related to these products of combustion.

NFS has reported on similar occurrences involving inadequate engineering evaluations of systems in the Weekly Summary. Following are some examples.

- Weekly Summary 97-35 reported that a facility manager at the Hanford Tank Farms learned that the sensor in a flammable gas detector system failed its quarterly calibration. Investigators determined that inadequate system design reviews resulted in the installation of equipment that could not reliably perform its safety function at low ambient temperatures. (ORPS Report RL--PHMC-TANKFARM-1996-0025)

- Weekly Summary 97-18 reported that test personnel at the Savannah River Site discovered that nuclear incident monitor bells did not meet audibility requirements for some areas within the evacuation zones. Facility modifications were not evaluated for impact on a system designed to alert personnel of a criticality. (ORPS Report SR--WSRC-FBLINE-1997-0016)

- Weekly Summary 97-13 reported that fire department inspectors at the Paducah Gaseous Diffusion Plant discovered improperly oriented sprinkler heads, areas without adequate coverage, and an improperly located sprinkler system. Investigators determined that structural changes were performed at the facility after the installation of the fire sprinkler system. (NRC Event Report Number 31972, 32002, and 32012)

- Weekly Summary 97-03 reported that all Plutonium Finishing Plant personnel evacuated in response to a criticality alarm caused by short-circuited, 24-volt dc wiring. An

inadequately researched modification unnecessarily activated the criticality safety alarm and caused evacuation of a building. (ORPS Report RL--PHMC-PFP-1997-0003)

These events illustrate the importance of thorough technical reviews of modifications and a disciplined configuration management program. Proposed modifications to any system need to be thoroughly reviewed for impact on the design basis and how they could affect existing facility systems and processes. Facility managers should ensure that all personnel are made aware of the need for detailed modification reviews and a stringent configuration management change control process, even for non-vital systems.

DOE-STD-1073-93, -Pt.1 and -Pt.2, *Guide for Operational Configuration Management Program, Including the Adjunct Programs of Design Reconstitution and Material Condition and Aging Management,* addresses modification technical reviews as part of the change control element. Section 1.3.4.2 of the standard recommends that the design authority review and approve changes before implementation. The section states that these reviews should be used to evaluate safety, environmental, and mission impacts. The standard also discusses the control of modifications that can lead to temporary or permanent changes in design requirements, facility configuration, or facility documentation. The standard discusses identifying changes, conducting technical and management reviews, and implementing and documenting changes.

DOE 5480.19, *Conduct of Operations Requirements for DOE Facilities*, chapter VIII, “Control of Equipment and System Status,” states that DOE facilities are required to establish administrative control programs to handle configuration changes resulting from maintenance, modifications, and testing activities.

KEYWORDS: configuration management, fire, freeze protection, modification control

FUNCTIONAL AREAS: Configuration Control, Modifications

3. FIRE ALARM PANEL PROBLEMS AT LOS ALAMOS NATIONAL LABORATORY

This week, OEAF engineers reviewed three occurrence reports submitted by Los Alamos National Laboratory personnel about fire alarm panel problems. On January 7, 1998, fire protection personnel discovered a de-energized fire panel. The circuit breaker for normal ac power to the panel was open and the backup batteries were depleted. On January 8, an operations mentor discovered that a test procedure for a fire panel could have compromised the ability of facility personnel to respond to a fire during panel testing. On January 9, removal of a compensatory fire watch before completion of surveillances on this same fire panel resulted in a violation of the facility Operational Safety Requirements (OSRs). These events are significant because proper testing and operation of fire alarm panels are important to prevent injury, loss of life, or loss use of a facility in the event of a fire. (ORPS Reports ALO-LA-LANL-PHYSCOMPLX-1998-0001, ALO-LA-LANL-CMR-1998-0001, and ALO-LA-LANL-CMR-1998-0002)

In the first event, fire protection personnel performing an annual fire system check discovered that a fire panel was de-energized. Upon investigation, they found the circuit breaker for the panel open and the backup batteries depleted. They closed the circuit breaker to re-energize the panel and replaced the batteries. Then they successfully verified that all detection zones and communications with the central alarm station functioned properly.

Investigators have not determined how or when the panel was de-energized, but they know that fire protection personnel de-energized it to conduct an annual test in November 1997. The testing was required because of Laboratory-wide concerns about serious problems with backup power supplies in similar fire alarm panels (Weekly Summary 97-46; ORPS Report ALO-LA-LANL-CMR-1997-0021). Investigators determined that the circuit breaker for the fire panel was not clearly marked. Facility personnel will install better labels to reduce the chances for inadvertent opening of the breaker. Investigators are trying to determine why a low-voltage trouble signal was either not received at the central alarm station or not acknowledged by operators.

In the second event, an operations mentor discovered that a technician left a fire alarm panel unattended (without alarm fuses) while conducting a test in a wing of the Chemistry and Metallurgy Research Facility. He left the panel with a screwdriver wedged in an alarm acknowledge button to hold it depressed with the alarm acknowledged light illuminated. The technician had also removed the alarm fuses. In this condition, all alarm horns and lights in the wing were disabled. Personnel in the wing would not have been alerted to an actual fire. During testing, the technician discovered that a zone alarm was not being transmitted to the central alarm station.

Investigators determined that the test procedure did not adequately address how to properly conduct testing on the fire panel. The procedure permitted the technician to place the panel in an unattended condition while disabling fire alarms. The procedure should have required two technicians to perform the test to eliminate the practice of “shimming” switches and pushbuttons. Fire protection personnel will establish policies for conducting tests, eliminating shimming, and reviewing test procedures for adequacy.

In the third event, the deputy facility manager established a fire watch as a compensatory measure in the wing of a facility during troubleshooting of the fire alarm panel problem. After replacing a defective circuit board, maintenance personnel performed a post-maintenance test on the affected circuits and declared the panel operational. Believing the panel to be fully operational, the deputy facility manager cancelled the compensatory fire watch. The next day, he determined that the facility was in violation of its OSRs because no one performed a complete OSR surveillance on the panel.

Investigators determined that the facility has no definition of operability. Compensatory measures should have remained in effect until operability was properly verified. The deputy facility manager re-established the fire watch and scheduled a complete OSR surveillance of the fire alarm panel.

In Weekly Summary 94-48, NFS reported a good practice at Savannah River that linked databases for compliance with safety requirements. A Defense Nuclear Facilities Safety Board assessment noted the positive aspects of a linking database that relates requirements of various authorization basis documents (safety analysis reports, OSRs, and technical standards) to the field implementation of those requirements. The linking database coordinates other programs, such as surveillance testing, and combines the information into one system. All safety limits associated with specific systems and components can be identified using the database. Facility personnel can query the new database about a particular procedure or test to determine which safety requirements are addressed by the procedure. The linking database also allows facility personnel to easily determine when new procedures or procedure revisions are needed when authorization requirements change.

These events illustrate the importance of understanding what constitutes system operability. They also indicate the need for adequate surveillance testing procedures that address proper testing practices and ensure that compensatory measures are in place while system functions and

features are disabled during testing. If a test requires alarms to be blocked by removing relays or fuses, the removal process should be documented and controlled by procedure.

DOE facility managers should ensure that surveillances for determining the operability of safety-required systems are properly performed. If systems are not operable because they failed, require maintenance, or did not pass surveillances, appropriate compensatory measures should be taken and maintained. DOE O 5480.22, *Technical Safety Requirements*, defines the terms "operable" and "operability" and provides six implementing principles. General principle 1, states: "A system is considered operable as long as there exists assurance that it is capable of performing its specified safety function(s)." Surveillance testing is essential in providing this assurance. The definition for operability, given in the Order, is "a system, subsystem, train, component, or device shall be operable or have operability when it is capable of performing its specified function(s), and when all necessary attendant instrumentation, controls, electrical power, cooling or seal water, lubrication, or other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its functions are also capable of performing their related support function(s)."

DOE contractors who operate nuclear facilities and fail to conduct required surveillances or implement corrective actions for identified deficiencies could be subjected to Price-Anderson civil penalties under the work processes and quality improvement provisions of 10 CFR 830.120, "Quality Assurance Requirements." DOE 0 420.1, *Facility Safety* (previously 5480.7A, *Fire Protection*), section 4.2.2, "Fire Protection Design Requirements," requires DOE facilities to have a means to summon the fire department, such as a fire alarm or signaling system. It also requires a means to notify and evacuate building occupants using a fire detection or fire alarm system.

KEYWORDS: surveillance, test, compliance, fire protection, operational safety requirement

FUNCTIONAL AREAS: Fire Protection, Licensing/Compliance, Procedures, Surveillance

4. CRITICALITY PROGRAM VIOLATIONS AT A COMMERCIAL NUCLEAR FUEL FACILITY

This week OEAF engineers reviewed a recent Nuclear Regulatory Commission (NRC) press release concerning nuclear criticality safety program weaknesses at a commercial nuclear fuel facility. NRC inspectors identified the weaknesses during an inspection conducted August 25 to 29, 1997. On January 7, 1998, the NRC issued a Notice of Violation and proposed the imposition of a civil penalty against the facility for six criticality safety violations. The violations involved the licensee's failure to (1) conduct adequate incident investigations, identify root causes, and take timely corrective action; (2) conduct adequate criticality safety evaluations; (3) functionally verify that installed safety controls matched the design documents; (4) update criticality safety evaluations following changes; (5) control criticality safety evaluation records; and (6) develop or implement various nuclear criticality safety procedures and policies that cover certain license conditions, including notification requirements. (NRC Press Release 98-02)

The NRC determined that the violations demonstrated the licensee's failure to implement a comprehensive program to ensure that plant operations involving the processing of special nuclear material were conducted in accordance with safety requirements. The NRC also determined that the licensee was ineffective in identifying the scope and magnitude of problems associated with the facility nuclear criticality safety program and in ensuring that appropriate corrective actions were taken.

According to the Notice of Violation, the proposed enforcement action resulted from two events involving the failure of controls designed to prevent an inadvertent criticality. On June 23, 1997, the licensee reported the loss of volume control for a hopper holding uranium powder before it is processed to make ceramic fuel pellets. The licensee discovered that the hopper volume was larger than assumed in the criticality safety analysis. The NRC staff concluded that this constituted a failure of one of the safety controls designed to prevent an accidental criticality. The NRC inspection team also reviewed facility personnel actions associated with an August event involving a loss of volume control for moisture dropout tanks connected with the fuel manufacturing process. The licensee discovered that plant personnel developed controls based on an assumed favorable volume of less than 5 gallons, when the actual volume was 20 gallons, which is unfavorable.

The NRC press release stated: "These violations are significant because they substantially degraded the approved processes in the license used to establish and maintain the safety program for processing special nuclear material and are indicative of a significant lack of attention or carelessness towards licensed responsibilities."

First Violation

Facility license application documents state, in part: “the facility organizational structure . . . and procedures . . . will provide for systematic investigation of abnormal events; making decisions on corrective measures to prevent recurrence of such events; and follow-up on the implementation of preventive measures. Further the facility will have in place a structured methodology for determining and categorizing the root cause(s) of the failure(s) that led to investigated events.” The NRC determined that the licensee failed to comply with these requirements as indicated by the following.

- Facility personnel failed to adequately determine and categorize the root cause(s) of the failure(s) that led to the loss of volume control for the granular hopper. According to the NRC, the licensee’s root cause analysis narrowly focused on the material accumulation in the hopper and did not address the broader problems of loss of volume control. Specifically, they said the analysis did not address the reason the criticality safety evaluation assumed a favorable volume when the as-built configuration was a non-favorable volume. System restart authorization after exceeding a defined mass control limit without approval by the nuclear criticality safety group and failure of the criticality safety evaluation to meet the technical requirements specified in the license also were not addressed.

- Site management had not reviewed or approved the recommendations of the root cause analysis team for the June event.

- Facility personnel erroneously assumed the tanks had favorable geometry, and no one initiated a root cause analysis before the system was restarted. No other controls were identified in the existing criticality safety evaluation.

Second Violation

Facility license documents require, in part, that for each significant portion of the process, a defense of one or more system parameters will be employed and documented with the criticality safety evaluation. Criticality safety evaluations are use to identify the specific controls necessary for the safe and effective operation of a process. The documents also state that nuclear criticality

safety controls will be incorporated into the process design criteria documentation. Other requirements state that an independent technical review will be performed for criticality safety assessments, criticality safety evaluations, or calculations in support of limits specified. The NRC determined that the licensee failed to comply with these requirements as indicated by the following.

- Facility personnel discovered that a 1996 granular hopper criticality safety evaluation developed criticality safety controls based on an assumed favorable volume when the actual hopper volume was unfavorable. At the time of the NRC inspection planted personnel reported that the 1996 documents could not be located. Both the original evaluation and independent technical review failed to identify that the process design criteria dimensions on the system print (process design criteria) did not match the dimensions necessary to ensure a favorable volume for this significant portion of the process.

- On August 26, NRC personnel discovered that a criticality safety evaluation conducted for a 1993 modification, developed controls based on an assumed criticality favorable volume of less than 5 gallons, when the actual volume of tanks in the system was 20 gallons, which is unfavorable. Both the original evaluation and an independent technical review failed to identify that the dimensions on the system print (process design criteria) did not match the dimensions necessary to ensure a favorable volume for this significant portion of the process.

Third Violation

Facility license documents require, in part, that before use in any process, controls necessary for the safe operation of a process will undergo a functional verification to assure that the controls selected and installed match the requirements in the design criteria. The NRC determined that the licensee failed to comply with these requirements as indicated by the following.

- In June, the licensee determined that the installed hopper was not a favorable volume as assumed in the nuclear criticality safety analysis. Since favorable volume was an analyzed contingency necessary for the safe operation of this system, this constituted a design requirement that was not functionally verified before use.

- In August, the licensee determined that the installed moisture drop-out tank volumes were not favorable as assumed in the nuclear criticality safety analysis. Specifically, the analysis identified the volume as less than 5 gallons, but the actual installed volumes were about 20 gallons each.

Fourth Violation

Facility license documents require that the criticality safety evaluation identify the significant parameters affected within a particular system and that all assumptions relating to process/equipment/material theory . . . are justified, documented, and independently reviewed. The NRC determined that the licensee failed to comply with these requirements as indicated by the following.

- As of August 29, 1997, no one had updated the hopper criticality safety evaluation to reflect the physical changes made to the system and no independent review was conducted.

- As of August 29, 1997, no one had updated the pellet area ventilation system criticality safety evaluation to reflect all of the analytical changes and new controls added to the moisture dropout tanks and no independent review had been conducted.

- As of August 29, 1997, criticality safety evaluations for processes did not document or justify the assumptions relating to process/equipment/material theory, function, and operation, including credible upset conditions.

Fifth Violation

Facility license documents require, in part, that written procedures will specify the management program for licensed activity records. They further require that the records be retained for the lifetime of the facility. The documents also define policies and procedures that establish record management programs for facility departments and assure the implementation of required quality assurance records systems. The NRC determined that the licensee failed to comply with these requirements as indicated by the following.

- As of August 29, 1997, nuclear criticality evaluations, analyses, and methodology validations were not listed as examples of plant quality assurance records under the program procedure.

- The original nuclear safety analysis for the granular hopper was not maintained for the lifetime of the plant.

Sixth Violation

Facility license documents require, in part, that regulatory-significant procedures define the policies of the regulatory component, including nuclear criticality safety, and identify the requirements for implementation of applicable NRC regulations and license components. The NRC determined that the licensee failed to comply with these requirements as indicated by the following.

- The nuclear criticality safety procedure provides criteria for performing and documenting program reviews to assess the effectiveness of all components of nuclear criticality safety. However, the program did not include (1) a verification program, (2) a maintenance program, (3) methods of criticality safety control, (4) use and implementation of all the controlled parameters defined in the license, or (5) control of criticality safety documentation.

- No procedure covered the development and implementation of passive engineered controls, such as geometry and volume, to assure that they are analyzed and evaluated for fabrication tolerances and dimensional changes that may occur through corrosion, wear, or mechanical distortion. In addition, procedures did not include provisions for periodic inspections if credible conditions exist for changes in dimensions of the equipment that may result in the inability to meet nuclear criticality safety limits.

- No procedure provided guidance for computer software and hardware configuration controls.

- No procedure provided guidance for establishing a program to maintain the quality of the outermost moderator barrier and to conduct routine inspections.

- The criticality alarm system procedure did not provide any guidance for the suspension of special nuclear material movement after placing the alarm system out of service.

- The regulatory affairs technical review procedure did not provide appropriate guidance for conducting independent reviews.

- The procedure for internal reporting and NRC notification of unusual occurrences did not address all necessary requirements.

The NRC credited the licensee for their immediate corrective actions and plans for long-term corrective actions. These corrective actions included: (1) shutdown of the pellet processing area on August 29; (2) completion of a comprehensive investigation and root cause analysis for each event; (3) establishment of a regulatory process review team to focus on the nuclear criticality safety process; (4) implementation of procedure revisions and personnel training; (5) initiation of an on-going, facility-wide field verification to demonstrate that the as-built or installed equipment conforms to the safety documentation; (6) verification that equipment and system documentation conforms to the analyses; (7) increased pace for conducting process hazards analyses for remaining systems; and (8) specific commitments to increase management oversight and control. However, the NRC also noted that these actions were not developed until after the NRC identified the violations. The licensee has 30 days to pay the civil penalty or protest its imposition.

The NRC proposes civil penalties for commercial nuclear utilities, uranium fuel fabricators, and other nuclear-related companies for violations of procedures, work instructions, and design requirements. Under the provisions of the Price-Anderson Amendments Act, DOE can fine contractors for violations of department rules, regulations, and compliance orders relating to nuclear safety requirements. DOE contractors who operate nuclear facilities and fail to implement corrective actions for identified deficiencies could be subjected to Price-Anderson civil penalties under the work processes and quality improvement provisions of 10 CFR 830.120, *Quality Assurance Requirements*. These actions include Notices of Violation and, where appropriate, non-reimbursable civil penalties. The primary consideration for determining whether DOE takes enforcement action is the actual or potential safety significance of the violation, coupled with how quickly the contractor acts to identify and correct problems. The Office of Enforcement and Investigation may reduce penalties when a DOE contractor promptly identifies a violation, reports it to DOE, and undertakes timely corrective action. DOE has discretion to not issue a notice of violation in certain cases. The Noncompliance Tracking System (Weekly Summaries 95-17 and 95-20) provides a means for contractors to promptly report potential noncompliances and take advantage of provisions in the enforcement policy. DOE STD-7501-95, *Development of DOE Lessons Learned Programs*, discusses management responsibility for incorporating appropriate corrective actions in a timely manner.

KEYWORDS: nuclear criticality safety, special nuclear material, notice of violation, compliance, corrective actions, Price-Anderson Act

FUNCTIONAL AREAS: Nuclear/Criticality Safety, Licensing/Compliance, Configuration Control, Lessons Learned